



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/866,035	05/25/2001	Akira Yamaguchi	09792909-5037	4263

7590 04/13/2005

David R. Metzger, Esq.
SONNENSCHN NATH & ROSENTHAL
Wacker Drive Station, Sears Tower
P.O. Box #061080
Chicago, IL 60606-1080

EXAMINER

RUTHKOSKY, MARK

ART UNIT	PAPER NUMBER
----------	--------------

1745

DATE MAILED: 04/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/866,035

Applicant(s)

YAMAGUCHI ET AL.

Examiner

Mark Ruthkosky

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/10/2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-12,14-22 and 24-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8-12,14-22 and 24-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The rejection of claims 4, 8, 11, 12, 14, 19, and 24 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention has been overcome by the applicant's amendment

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5, 8 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Komaru et al. (JP 10-308,236.)

The instant claims are to a nonaqueous electrolyte secondary battery comprises a cathode having a cathode active material capable of being electrochemically doped/dedoped with lithium; an anode having an anode active material capable of being electrochemically doped/dedoped with lithium and a nonaqueous electrolyte interposed between the cathode and the anode,

Art Unit: 1745

wherein said cathode active material is a lithium composite oxide expressed by a general formula Li_xMO_2 where, x is not smaller than 0.9 and M indicates at least one or more elements selected from between Fe, Co, Mn, Cu, Zn, Al, Sn, B, Ga, Cr, V, Ti, Mg, Ca and Sr, and said nonaqueous electrolyte includes a vinylene carbonate and an antioxidant.

Komaru et al. discloses lithium secondary batteries that include a LiCoO_2 cathode active material and a carbon anode active material. The active materials are coated on both sides of the current collectors. (Paragraphs 177-184) The electrode includes a non-aqueous solvent. Vinylene carbonate is disclosed as a solvent additive in an amount less than 20 wt. (Paragraph 105.) Phenol, an antioxidant, is disclosed as an electrolyte solvent component. (See paragraph 204, formula 74.) The solvent further includes methoxybenzene compounds. (Paragraph 188) The methoxybenzene compound concentration is preferably 0.005-9.8 M, which is in applicants' claimed range of 0.01 to 10 M%. (Paragraph 98.) Formulas 12-14 illustrate fluoro-anisoles as the methoxybenzene compounds. (Paragraphs 51-53).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6, 9-12, 14-22, 24 and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mayer (US 5,783,333) in view of Komaru et al., JP 10-308236.

Art Unit: 1745

Mayer discloses lithium secondary batteries comprising composite positive electrodes. The composite cathodes contain lithium nickel cobalt metal oxides together with lithium manganese metal oxide of the formula $\text{Li}_x\text{Mn}_{2-r}\text{M}'_r\text{O}_4$, where r is a value between 0 and 1 and M' is chromium, titanium, tungsten, nickel, cobalt, iron, tin, zinc, zirconium, silicon, or a combination thereof, (the abstract.) The cell will include (1) a cell container, (2) a composite positive electrode 3) an intercalation negative electrode capable of reversibly taking up lithium on charge and releasing lithium on discharge, (4) an electrolyte conductive to lithium ions, and (5) a separator between the negative electrode and positive electrode (see column 13, lines 24-31.) The electrolyte preferably includes a mixture of ethylene carbonate, diethyl carbonate and diethyl carbonate with a dissolved lithium-containing salt, and may also include of polymer or gelling agent, (column 4, lines 52-64.) Mayer thus discloses gelled electrolytes. A battery may be constructed by winding a thin negative electrode sheet and a thin positive electrode sheet separated by a separator sheet together into a spiral roll and placing the roll in the battery can, (column 13, lines 35-40.)

The disclosure of Mayer differs from applicants' invention in that Mayer does not specifically disclose the addition of vinylene carbonate, antioxidants and/or methoxybenzene in the battery electrolyte. Komaru et al. disclose using vinylene carbonate and anti-oxidants, along with methoxybenzene, as a lithium battery electrolyte composition. The addition of such compounds are taught as decreasing irreversible reactions at the lithium battery electrodes and thus improving cycle life (capacity retention) of the battery, (see Komaru, paragraph 13.) It would have been obvious to one of ordinary skill in the art to add any of methoxybenzene,

Art Unit: 1745

vinylene carbonate or antioxidants as additives to the batteries disclosed by Mayer because Komaru teaches these additives will improve the cycle life of the batteries.

Response to Arguments

Applicant's arguments filed 10/1/2004 have been fully considered but they are not fully persuasive.

35 U.S.C. 112: The rejection under 35 U.S.C. 112, 2nd paragraph has been overcome by the applicant's amendment.

35 U.S.C. 102 and 103: Applicants' argue that neither Komaru et al. nor Meyer teach or describe a nonaqueous electrolyte having both a vinylene carbonate and an antioxidant. However, as discussed above, Komaru et al. discloses non-aqueous electrolytes containing both vinylene carbonate and phenol. Thus, Komaru et al. teaches and suggests a nonaqueous electrolyte having both a vinylene carbonate and an antioxidant. It is noted that the additives including phenol are intentionally added although the material is described as an impurity. Komaru et al. teaches vinyl carbonate, an antioxidant and methoxybenzene in an electrolyte. From this, the claims are anticipated.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's

Art Unit: 1745

supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free.)

Mark Ruthkosky

Primary Patent Examiner

Art Unit 1745

Mark Ruthkosky
4/8/05

**MARK RUTHKOSKY
PRIMARY EXAMINER**